STRIK BALDINELLI MONIZ

PLANNING • CIVIL • STRUCTURAL • MECHANICAL • ELECTRICAL

TRAFFIC IMPACT STUDY

24605 SAXTON ROAD

STRATHROY, ONTARIO

PROPOSED RESIDENTIAL DEVELOPMENT

2102603 ONTARIO INC.

OCTOBER 2024

SBM-17-0068

LONDON LOCATION

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London, ON, N5X 4E8
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KITCHENER LOCATION

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2102603 Ontario Inc.
82 Caroline Street
Stratford, Ontario N5A 7L9

October 9, 2024
SBM-17-0068

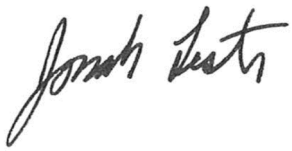
Attn: Tom Melanson

Re: Traffic Impact Study
24605 Saxton Road
Strathroy, Ontario

Strik, Baldinelli, Moniz Ltd. is pleased to provide you with the enclosed Traffic Impact Study report for the proposed residential development of 24605 Saxton Road in Strathroy, Ontario.

We trust this submission meets your satisfaction and will assist with the approval of your development. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Respectfully submitted,
Strik, Baldinelli, Moniz Ltd.
Planning • Civil • Structural • Mechanical • Electrical



Jonah Lester, P.Eng.
Transportation Engineer

EXECUTIVE SUMMARY

This Transportation Impact Study (TIS) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for 2102603 Ontario Inc. to identify transportation impacts, or a lack thereof, associated with the proposed residential development located at 24605 Saxton Road in Strathroy, Ontario. This TIS is an updated version of the February 2024 TIS that was prepared for this property to reflect the current proposal to develop the entire property as residential use (previously, residential was only considered for the south portion of the property).

The development is proposed to include two eight-storey apartment buildings with 92 dwelling units each, plus 36 back-to-back townhouse units (total of 220 units). Vehicular access is proposed from Saxton Road and a connection to the commercial site to the north, which has access from both Saxton Road and Carroll Street East.

This study has forecasted traffic volumes for a 2034 horizon year and assessed traffic operations within the vicinity of the subject site for existing, future background and future total traffic conditions. Site accesses, parking provisions and active transportation considerations have also been assessed. Based on the analysis completed, the following key conclusions and recommendations are made in this TIS:

- It is forecast that the proposed development will generate only 76 new trips in the AM peak hour (15 in and 61 out) and 80 trips during the PM peak hour (50 in and 30 out).
- Under existing conditions, all movements at the intersections within the study area are operating well. All movements have v/c ratios below 0.27 and operate at LOS C or better during the peak hours.
- The Municipality is currently upgrading Saxton Road to an urban cross-section with enhanced pedestrian facilities (construction is in progress) and the Municipality's TMP recommends that intersection improvements (signalization) be implemented for the Carroll Street East and Saxton Road intersection in the medium term (6 – 15 years).
- Traffic signal warrant analysis was performed for the Carroll Street East and Saxton Road intersection under both 2034 background and total traffic conditions and it was concluded that traffic signals are not expected to be warranted.
- MTO left turn lane warrants were reviewed for the potential need for a northbound left turn lane on Saxton Road at the Walmart Access under existing and future traffic conditions. It was determined that a left turn lane is not warranted.
- A left turn lane will not be warranted on Saxton Road at the proposed site access.
- We have no concerns about the proposed site access location on Saxton Road as it allows good visibility and does not conflict with any other accesses or intersections.
- Under 2034 background and total traffic conditions, the majority of the study area intersections will operate well with all movements at LOS B or better during the peak hours. The one exception is the intersection of Carroll Street East and Saxton Road, which will experience longer delays (LOS F) for the northbound and southbound movements during the PM peak hour, and the northbound movement will be nearing capacity (v/c ratio of 0.95) under 2034 total traffic conditions.

  Potential capacity improvements such as the addition of a northbound right turn lane or signalization were considered for the Carroll Street East and Saxton Road intersection. The

addition of a northbound right turn lane would provide some additional capacity for the critical northbound movement (maximum future v/c ratio would be reduced to 0.80), but the northbound and southbound left-through lanes would still operate at LOS F during the peak hour.

As a signalized intersection, Carroll Street East and Saxton Road would function well beyond the horizon period, with all movements at LOS C or better and all v/c ratios at or below 0.35.

Since the need for additional capacity at the Carroll Street East and Saxton Road intersection will largely depend on the build-out of many developments in the area, we suggest that the Municipality and County continue to monitor the traffic volumes and operations at the intersection to determine appropriate timing for future signalization and/or the need for any interim capacity improvements.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1 INTRODUCTION

This Transportation Impact Study (TIS) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for 2102603 Ontario Inc. to identify transportation impacts, or a lack thereof, associated with the proposed residential development located at 24605 Saxton Road in Strathroy, Ontario. This TIS is an updated version of the February 2024 TIS that was prepared for this property to reflect the current proposal to develop the entire property as residential use (previously, residential was only considered for the south portion of the property).

The development is proposed to include two eight-storey apartment buildings with 92 dwelling units each, plus 36 back-to-back townhouse units (total of 220 units). Vehicular access is proposed from Saxton Road and a connection to the commercial site to the north, which has access from both Saxton Road and Carroll Street East. The location of the proposed development is illustrated in Figure 1.

Figure 1: Site Location

Aerial Image Source: Google Earth (July 2018 imagery)

1.1 SCOPE AND METHODOLOGY

The general scope of the analysis in this study is summarized in Table 1. The TIS scope was confirmed with Municipality of Strathroy-Caradoc (Municipality) and County of Middlesex (County) staff prior to commencing the study.

Table 1: Study Scope and Parameters

Study Scope and Parameters	
Analysis Intersections (Study Area)	• Saxton Road / Carroll Street East • Saxton Road / 150 Carroll Street East Access (Walmart Access) • Saxton Road / Walkers Drive • Saxton Road / Proposed Site Access
Analysis Time Periods	• Weekday AM peak hour • Weekday PM peak hour
Analysis Scenarios (Years)	• Existing Traffic • 2034 Background Traffic • 2034 Total Traffic

The intersection operational analysis has been performed using Synchro 11 software based on the Highway Capacity Manual 2000 (HCM 2000) methodology published by the Transportation Research Board National Research Council.

The main goal of the operational analysis is to identify critical intersections or movements where:

- the volume to capacity ratio (v/c ratio) for overall operations, through movements, shared through/turning movements increased to 0.9 or above and Level of Service (LOS) E or worse.
- v/c ratios for dedicated turning movements increased to 0.9 or above and LOS E or worse.
- Queues for an individual movement and turning movement projected to exceed available lane storage (95th percentile queue).

Level of Service (LOS) is a function of the average control delay for an entire intersection or an individual movement. The relationships between the LOS letters and average delay ranges are defined in Table 2 for signalized and unsignalized intersections.

Table 2: Vehicular Level of Service Designations

LEVEL OF SERVICE (LOS)	CONTROL DELAY PER VEHICLE (s)	
	SIGNALIZED INTERSECTION	UNSIGNALIZED INTERSECTION
A	≤ 10	≤ 10
B	10 to 20	10 to 15
C	20 to 35	15 to 25
D	35 to 55	25 to 35
E	55 to 80	35 to 50
F	> 80	> 50

2 EXISTING CONDITIONS

2.1 SITE CONTEXT

The 24605 Saxton Road property is currently vacant land. The northern half of the property has received site plan approval for two commercial buildings, but these would no longer be implemented with the current development proposal. The property is bounded by commercial development to the north, Saxton Road to the east, existing residential properties to the south, and future commercial lands to the west, as shown in Figure 2.

2.2 EXISTING ROAD NETWORK

A site visit was conducted on December 7th, 2023 to review current road and intersection conditions. The existing road network is described below and the existing lane configurations, traffic control and storage lengths are illustrated in Figure 3.

Saxton Road is a two-lane collector road running generally north-south with a posted speed limit of 50 km/h. It has a rural cross-section (no curb and gutter) with a sidewalk on the west side of the road along the frontage and to the north of the subject site. Upgrades to Saxton Road are currently being constructed, which is discussed further in Section 3.4.

Carroll Street East (Middlesex County Road 10) is a two-lane arterial road running east-west under the jurisdiction of the County with a posted speed limit of 50 km/h. To the west of Saxton Road, Carroll Street East has an urban cross-section (curb and gutter) with sidewalk on the north side of the road. To the east of Saxton Road, Carroll Street East has a rural cross-section with no sidewalk.

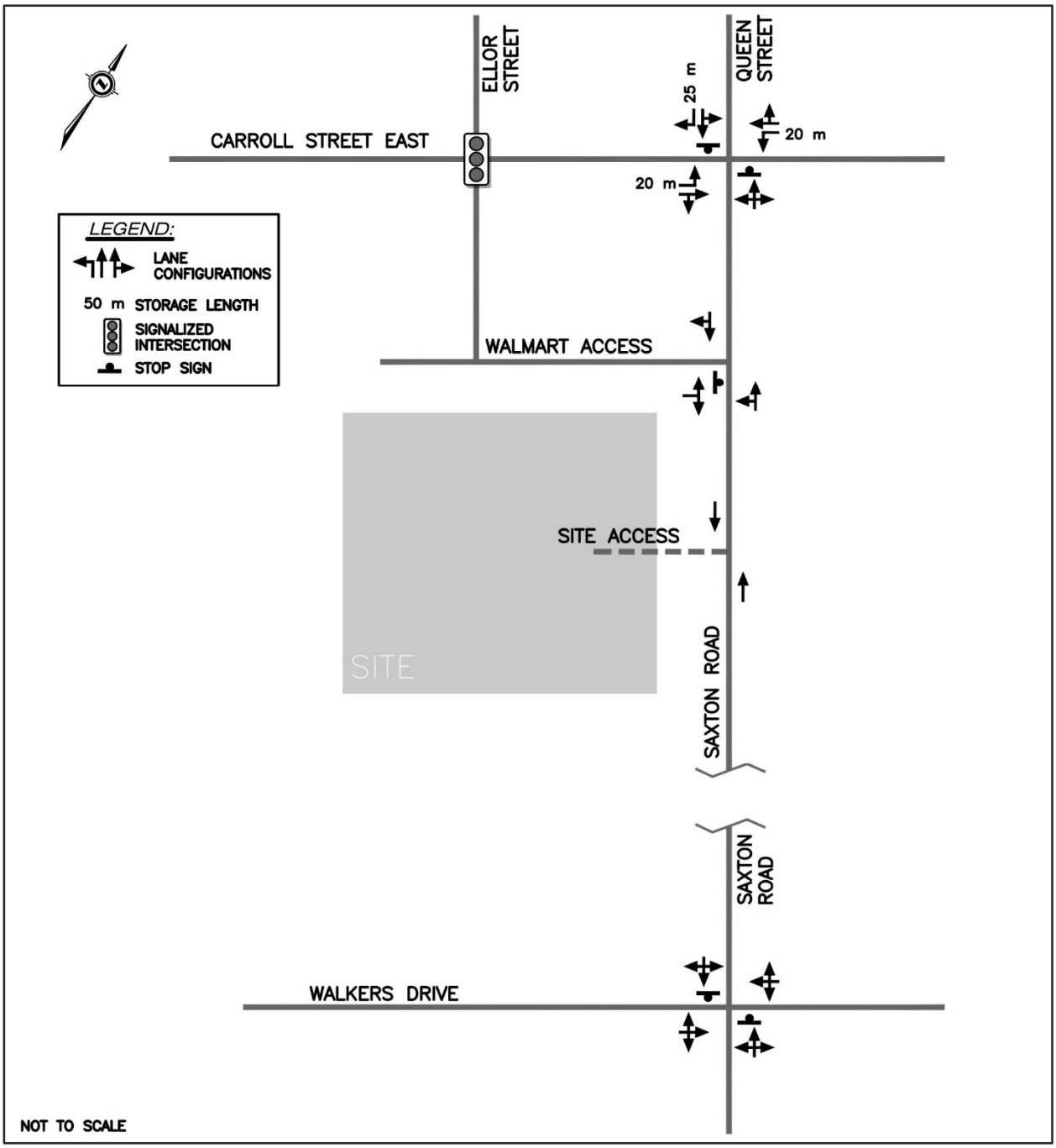
To the north of Carroll Street East, Saxton Road becomes Queen Street, which is a local two-lane road with a posted speed limit of 50 km/h. Queen Street has a semi-urban cross-section with no curb and gutter or ditches, and a sidewalk on the east side of the road.

Walkers Drive is a local rural road with an assumed (unposted) speed limit of 80 km/h. There are no sidewalks on Walkers Drive.

Figure 2: Site Area

Map Source: Google Earth (July 2018 imagery)

Figure 3: Existing Study Area Traffic Control and Lane Configuration



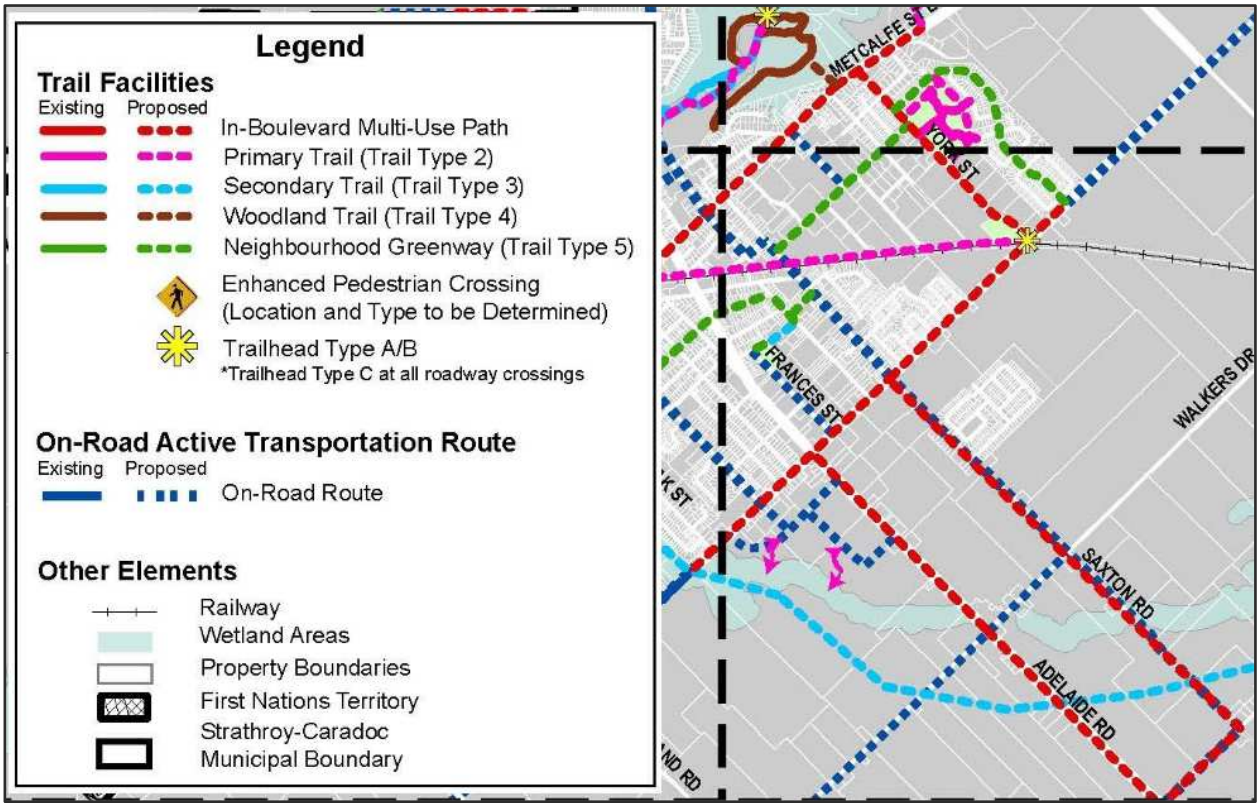
2.3 ACTIVE TRANSPORTATION FACILITIES

In the study area, sidewalks exist along the west side of Saxton Road between Carroll Street East and the subject site, and on the north side of Carroll Street East to the west of Saxton Road.

There are currently no designated cycling facilities through the study area, however, the *Strathroy-Caradoc Recreational Trails Master Plan* (2022) identifies Carroll Street East and Saxton Road as planned for future in-boulevard multi-use paths, which will provide improved cycling options for the area.

An excerpt of the proposed trail network from the *Recreational Trails Master Plan* is shown in Figure 4.

Figure 4: Proposed Trail Network from the Strathroy-Caradoc Recreational Trails Master Plan (2022)



Source: Strathroy-Caradoc Recreational Trails Master Plan (2022)

2.4 EXISTING TRAFFIC VOLUMES

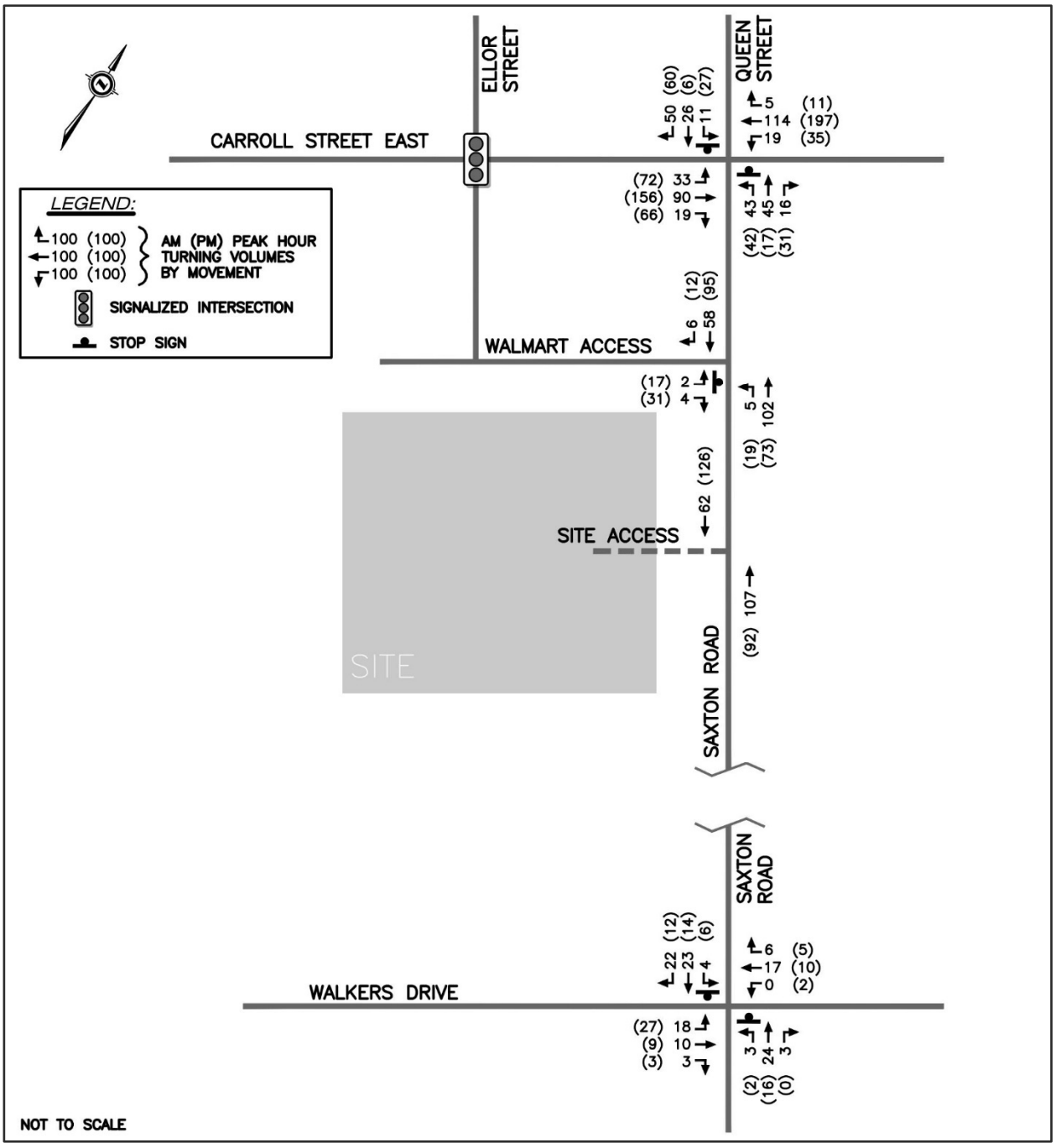
Turning movement counts were undertaken by Accu-Traffic Inc. at the existing study area intersections on Thursday, December 7th, 2023 during the AM and PM peak periods. The traffic count data is provided in Appendix A.

The traffic volumes on Carroll Street East and Saxton Road were factored up by 2% (i.e. one year of traffic growth) to be representative of 2024 volumes.

Queen Street was under construction at the time of the traffic counts and was open to local traffic only, therefore the traffic volumes to and from Queen Street were increased by 50% to better reflect normal conditions.

With the above adjustments applied, the 2024 peak hour traffic volumes for the study area intersections are illustrated in Figure 5. It is noted that the Carroll Street East and Ellor Street intersection is shown for context in the traffic figures in this report, however, no traffic volumes are shown since that intersection is not part of the study area.

Figure 5: 2024 Peak Hour Traffic Volumes



2.5 EXISTING TRAFFIC OPERATIONS AND QUEUING

Existing traffic operations were assessed at the study area intersections based on the existing lane configurations and 2024 traffic volumes presented in Sections 2.2 and 2.4. Table 3 provides a summary of the existing intersection operations and complete Synchro output reports are provided in Appendix B.

Table 3: 2024 Intersection Operations Summary

INTERSECTIONS / MOVEMENTS		2024 TRAFFIC			
		AM PEAK HOUR		PM PEAK HOUR	
		V/C	LOS	V/C	LOS
Carroll Street East and Saxton Road	EB L	0.03	A	0.06	A
	EB TR	0.08	A	0.14	A
	WB L	0.02	A	0.03	A
	WB TR	0.09	A	0.14	A
	NB L	0.26	B	0.26	C
	SB LT	0.09	B	0.12	C
	SB R	0.07	A	0.08	A
Saxton Road and Walmart Access	EB LR	0.01	A	0.07	A
	NB LT	0.00	A	0.02	A
	SB TR	0.05	A	0.08	A
Saxton Road and Walkers Drive	EB LTR	0.02	A	0.02	A
	WB LTR	0.00	A	0.00	A
	NB LTR	0.05	A	0.03	A
	SB LTR	0.08	A	0.04	A

Notes: V/C - Volume to Capacity Ratio, LOS – Level of Service
EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound
L – Left, T – Through, R – Right

From the results shown, it can be seen that the existing intersections are operating well during the peak hours, with v/c ratios of 0.26 or lower and LOS C or better for all movements.

Queuing results were also reviewed by comparing the 95th percentile queue length from the Synchro analysis with the available storage length for the turn lanes within the study area in order to determine where queues may block adjacent lanes. The results are summarized in Table 4, which includes queues for stop controlled movements at the intersections as well.

Table 4: 2024 Intersection Queuing

INTERSECTIONS / MOVEMENTS		AVAILABLE STORAGE (m)	95th PERCENTILE QUEUE (m) 2024 TRAFFIC	
			AM	PM
Carroll Street East and Saxton Road	EB L	20	5	5
	WB L	20	5	5
	NB LTR	-	8	5
	SB LT	-	5	8
	SB R	25	5	5
Saxton Road and Walmart Access	EB LR	-	5	5
Saxton Road and Walkers Drive	NB LTR	-	5	5
	SB LTR	-	5	5

Notes: EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound
L – Left, T – Through, R – Right
Queue lengths that were less than 5 m have been rounded up to 5 m to represent a minimum of one car length.

The existing queuing results show that the existing turning lane storage lengths sufficiently accommodate the 95th percentile queues for the existing traffic volumes and there are no other queuing concerns.

3 FUTURE BACKGROUND TRAFFIC

Future background traffic includes existing traffic with a general growth rate applied, plus traffic anticipated to be generated from other developments surrounding the study area. For the purpose of this study, a 10-year horizon period (2034 horizon year) was selected for future traffic projections and analysis.

3.1 BACKGROUND GROWTH RATE

A background growth rate of 1.5% per annum was applied to the traffic volumes in the study area. This general growth rate was selected to be slightly lower than the expected population growth rate recognizing that the traffic forecasted for several other specific developments in the area will be layered on top of the general growth.

3.2 BACKGROUND DEVELOPMENT TRAFFIC

The Municipality identified the following developments to be taken into consideration in the future background traffic forecasts:

- Strathroy Crossing - Block A (96 Carroll Street East);
- Strathroy Crossing – Block B1 (96 Carroll Street East) plus remaining commercial land to the south;
- Fieldcrest Subdivision;
- 360 Carroll Street East Subdivision.

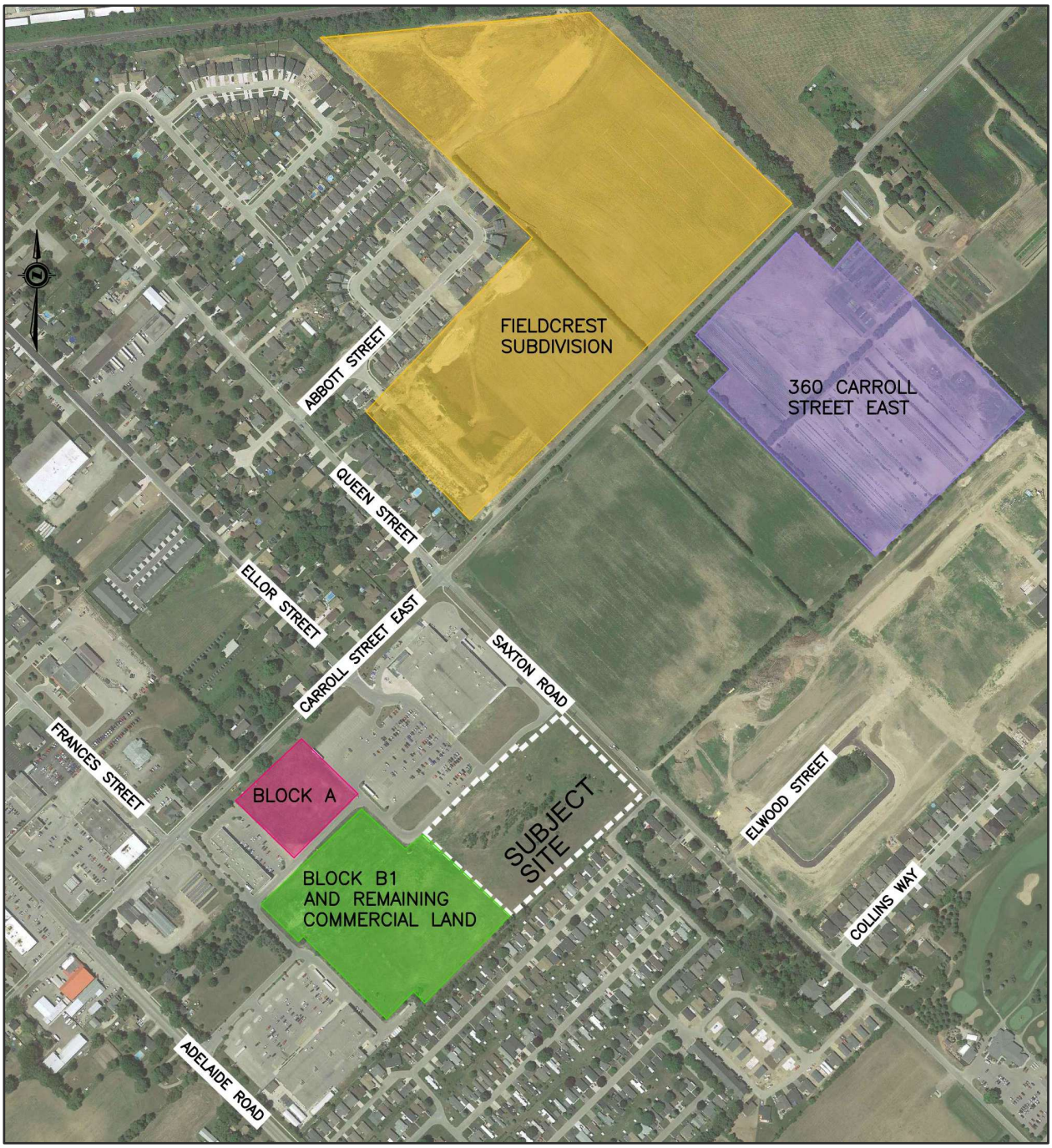
It is noted that in the February 2024 version of this TIS, the approved commercial buildings in the north part of the subject property (Blocks C1 and C2) were included as a background development, however these have now been removed from the background traffic since they will not be built with the current development proposal.

A summary of the background development plans (or assumed uses) is provided in Table 5 and the location of the background developments are shown in Figure 6. Site or Draft Plan drawings for the background developments are provided in Appendix C.

Table 5: Background Developments Summary

BACKGROUND DEVELOPMENT	DESCRIPTION OF DEVELOPMENT PLAN	GFA / UNITS
Strathroy Crossing Block A	-Two restaurants with drive-through windows -Two retail commercial buildings (m2).	3,940 ft^2 22,518 ft^2
Strathroy Crossing Block B1 plus commercial land to the south	B1: Two restaurants with drive-through windows Remaining Commercial Land: Assumed to include retail commercial buildings with a supermarket	7,970 ft^2 22,518 ft^2
Fieldcrest Subdivision	-Single family detached homes	185 units
360 Carroll Street East Subdivision	-Single family detached homes -Townhouses -Medium density block (assumed low-rise apartments or stacked townhouses)	72 units 45 units 30 units (assumed)

Figure 6: Background Development Locations



Map Source: Google Earth (July 2018 imagery)

Traffic studies for the background developments were not available, so the trip generation for each development was estimated based on published rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition.* The ITE land uses (and codes) applied to each background development along with the expected peak hour new trips are summarized in Table 6.

Minor reductions for internal interaction trips (i.e. trips that make stops at multiple facilities within a site) have been applied. Pass-by trips (trips that are already using the adjacent road network and stop at the

site since they are passing by) account for a large proportion of commercial traffic (especially for fast food restaurants), therefore pass-by trip rates (percentages) have also been applied. The specific percentages of internal interaction reductions and pass-by trips applied for each development are listed in the notes in Table 6.

Table 6: Background Developments New Trip Generation Summary

BACKGROUND DEVELOPMENT	ITE LAND USES APPLIED	AM PEAK HOUR NEW TRIPS			PM PEAK HOUR NEW TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Strathroy Crossing Block A	822 Strip Retail Plaza (<40k)[1,2] 934 Fast Food Restaurant with Drive Through[1,3]	63	48	111	62	56	118
Strathroy Crossing Block B1 and Remaining Commercial	821 Shopping Plaza (40k-150k) – with Supermarket[1,5] 934 Fast Food Restaurant with Drive Through[3,4]	153	102	255	195	204	399
Fieldcrest Subdivision	210 Single Family Detached	33	97	130	112	65	177
360 Carroll Street East Subdivision	210 Single Family Detached 215 Single Family Attached 220 Multifamily Housing (Low-Rise)	28	81	109	82	50	132
Total New Trips		**277**	**328**	**605**	**451**	**375**	**826**

Notes:

[1] Internal interaction reduction of 10% applied for AM and PM.
[2] Pass-by trip percentages of 30% applied.
[3] Pass-by trip percentages of 49% and 50% applied for AM and PM, respectively.
[4] Internal interaction reduction of 20% applied for AM and PM.
[5] Pass-by trip percentages of 30% and 34% applied for AM and PM, respectively.

The background development traffic has been distributed over the road network based on a combination of the existing traffic patterns in the area and expected origin/destinations. Table 7 summarizes the trip distribution applied to the background developments traffic. It is noted that trip percentages via "Collins Way" is meant to represent trips to/from any road or access off Saxton Road between the Walmart Access and Walkers Drive.

Table 7: Commercial Background Developments Trip Distribution Summary

DIRECTION TO / FROM	VIA	IN / OUT		
		COMMERCIAL DEVELOPMENTS	FIELDCREST SUBDIVISION	360 CARROLL STREET EAST SUBDIVISION
North	Queen Street	10%	15%	5%
	Ellor Street	5%	0%	0%
South	Saxton Road	3%	5%	5%
	Collins Way	10%	0%	5%
East	Carroll Street East	45%	45%	45%
	Walkers Drive	5%	5%	5%
West	Carroll Street East	20%	30%	35%
	Walkers Drive	5%	0%	0%
	Total	100%	100%	100%

Pass-by trips for the commercial developments were assumed to come from traffic on Carroll Street East and Adelaide Street (due to higher existing traffic volumes), so no pass-by trips were added to the study area.

Based on the above trip generation estimates and trip distribution assumptions, the traffic volumes through the study area associated with each background development are illustrated in Figure 7 through Figure 10.

Figure 7: Background Development Traffic from Strathroy Crossing Block A

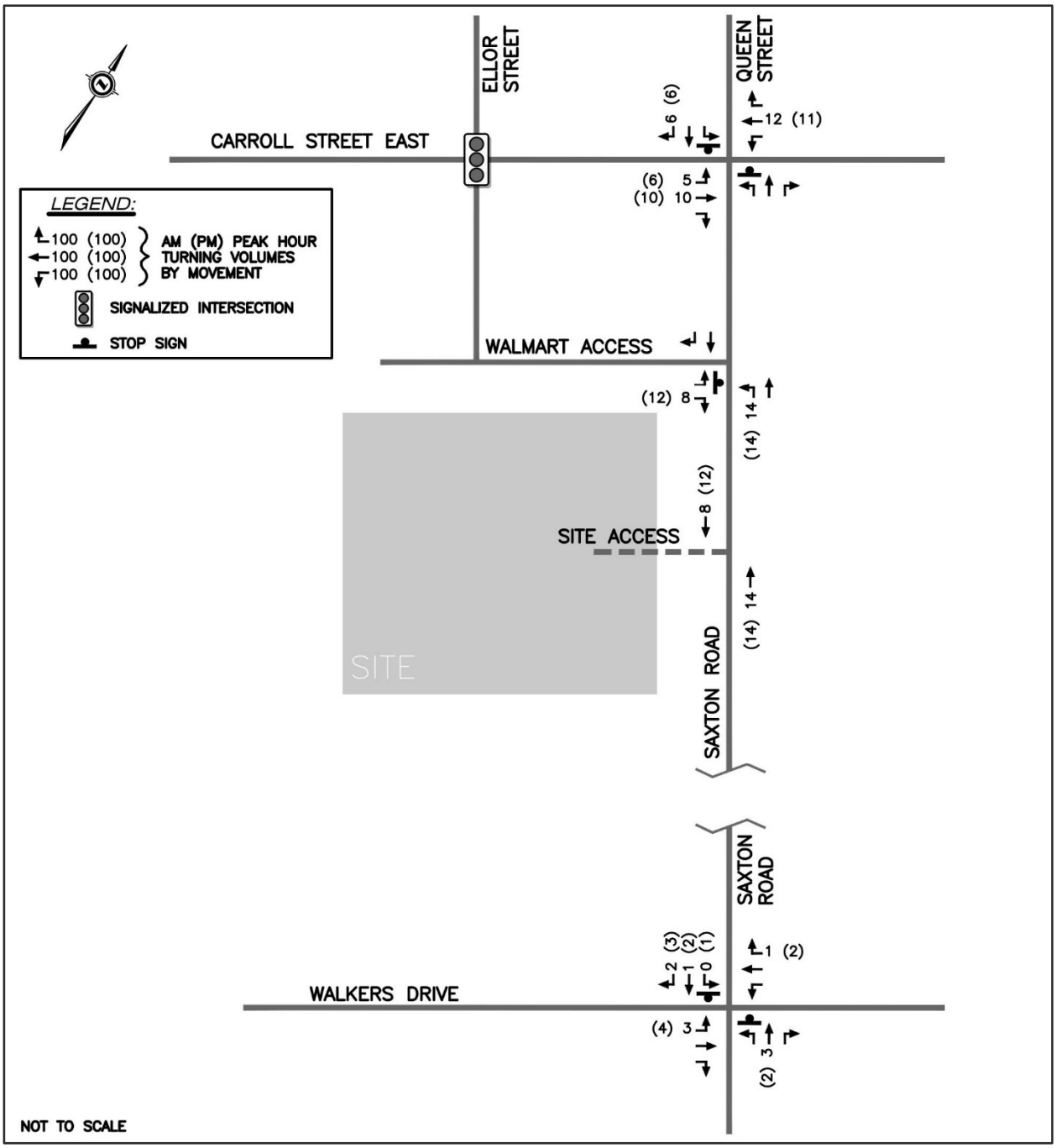


Figure 8: Background Development Traffic from Strathroy Crossing Block B1 and Rest of Commercial Land

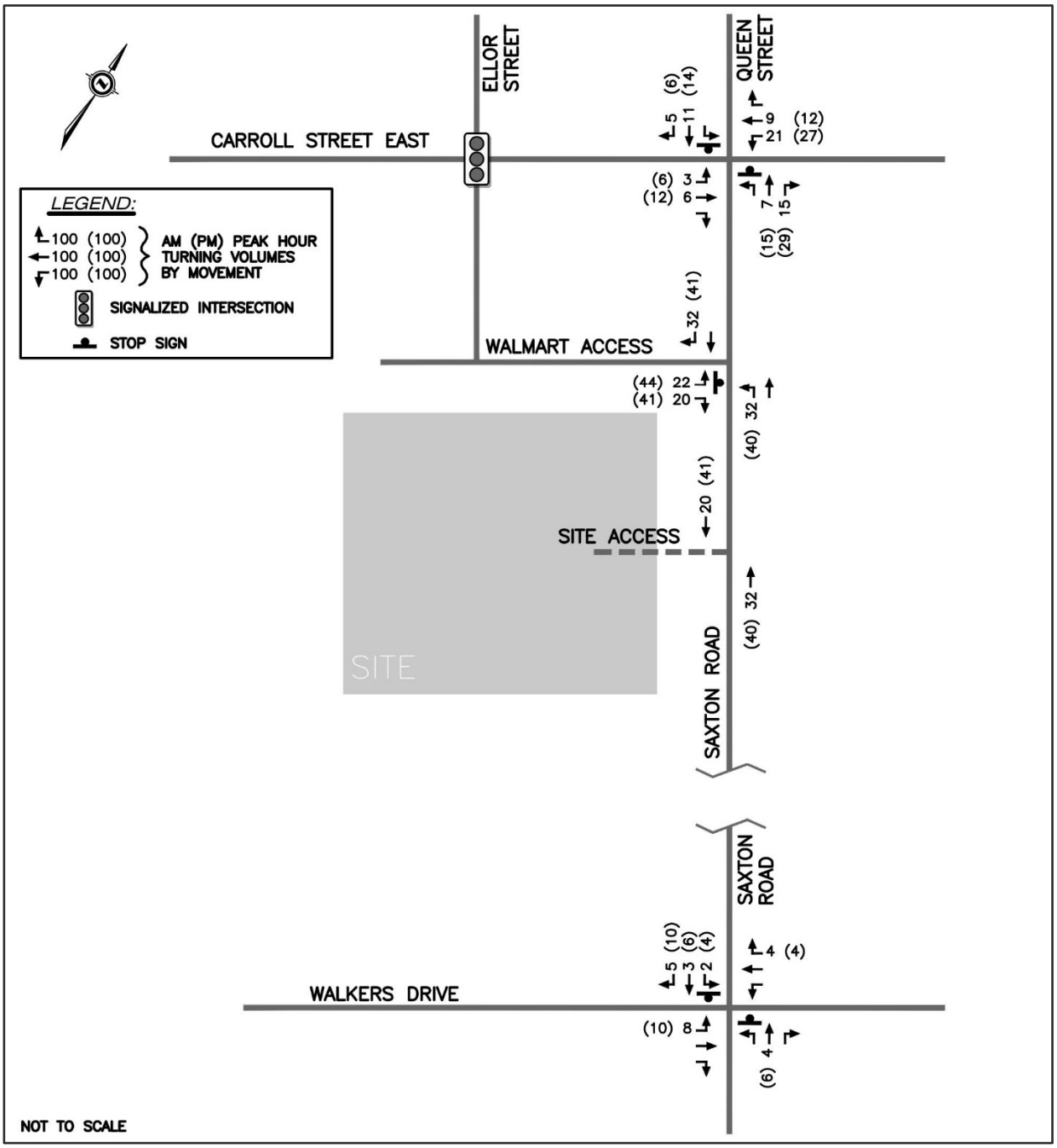


Figure 9: Background Development Traffic from Fieldcrest Subdivision

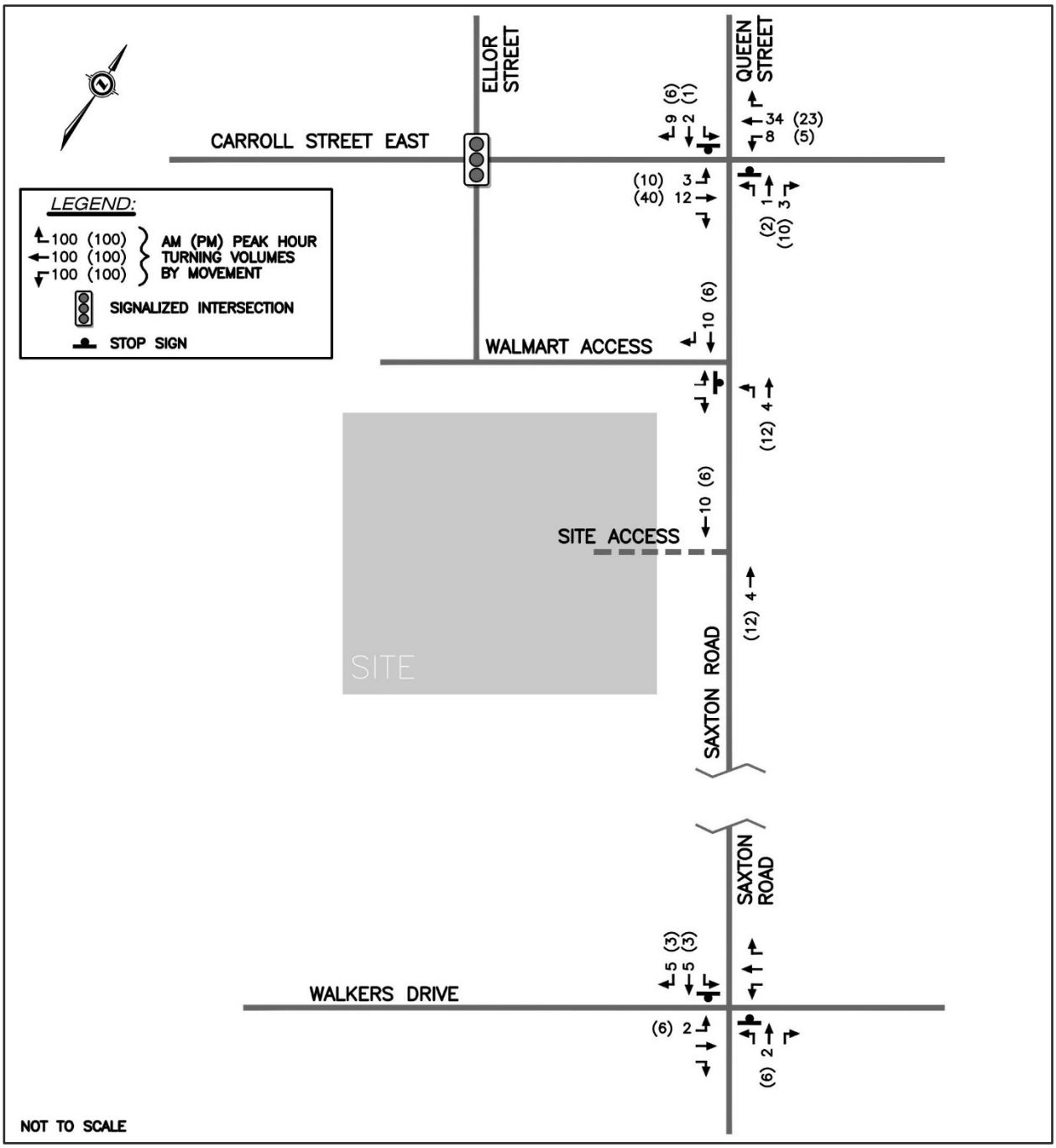
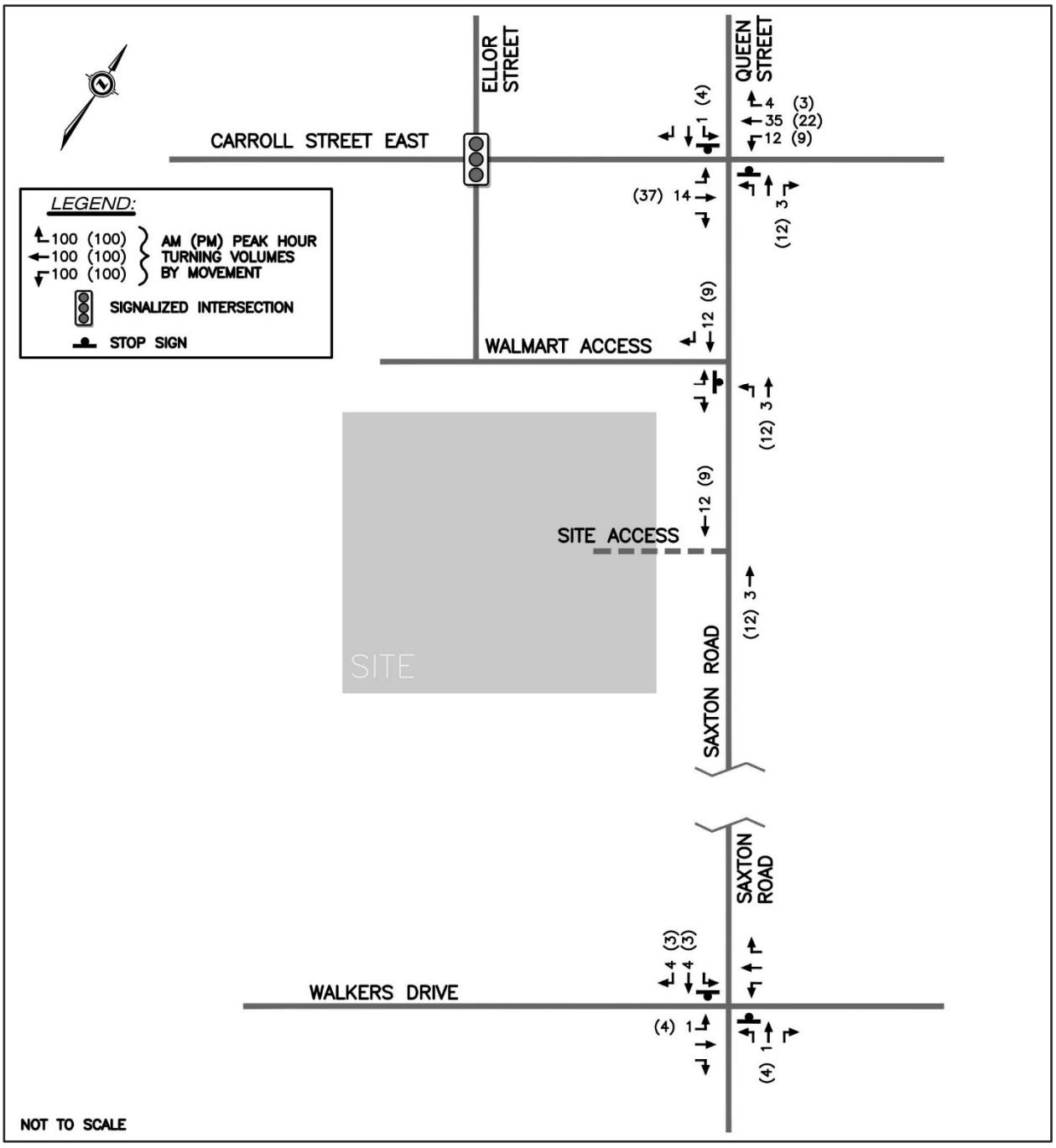


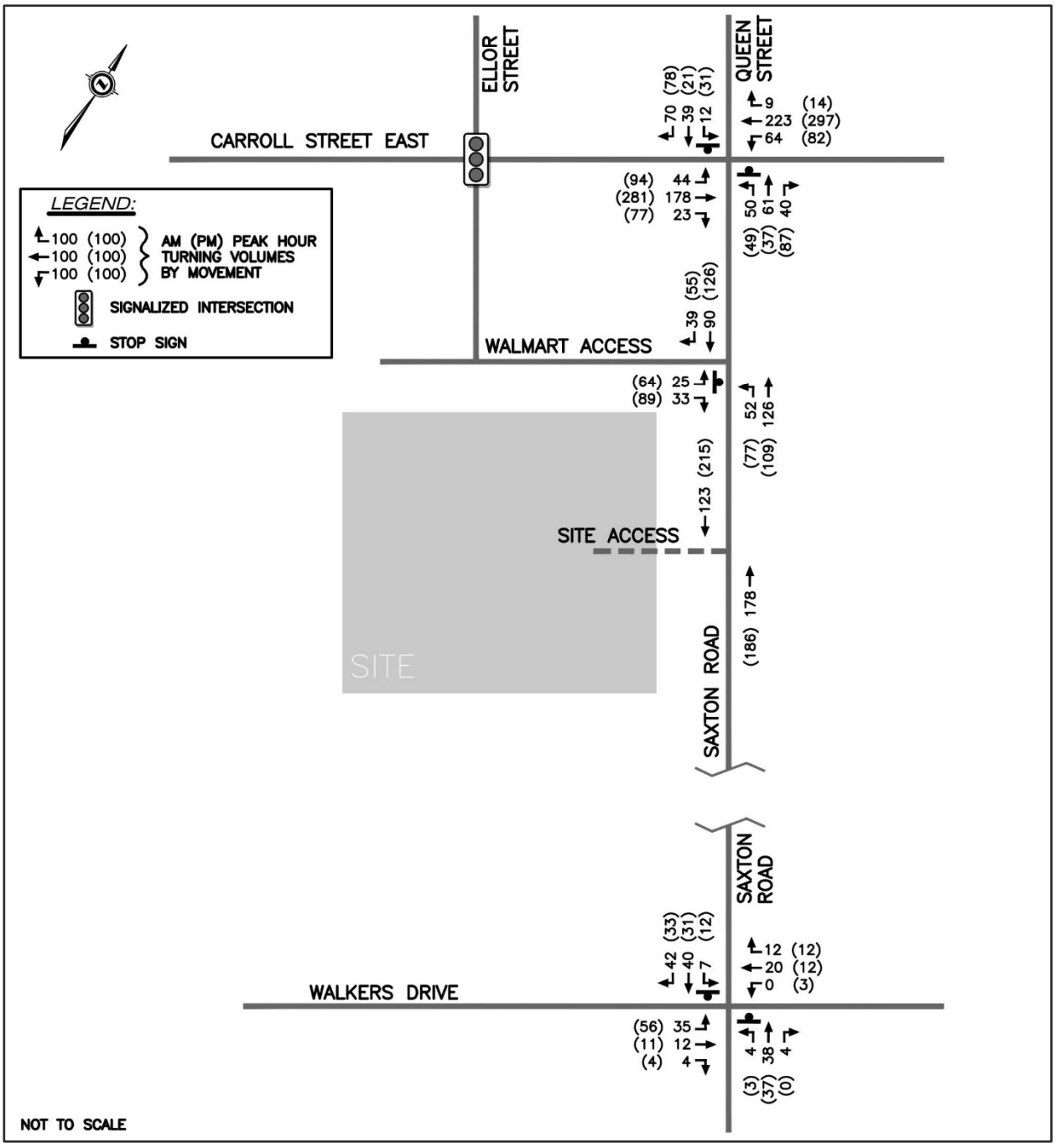
Figure 10: Background Development Traffic from 360 Carroll Street East



3.3 2034 BACKGROUND TRAFFIC VOLUMES

With the background growth rate applied to the existing traffic (from Figure 5), plus the addition of the background development traffic (from Figures 7 through 10), the resulting 2034 background traffic volumes are presented in Figure 11.

Figure 11: 2034 Background Traffic Volumes



3.4 FUTURE ROAD NETWORK

Road upgrades for Saxton Road have been designed and are currently being constructed. It is our understanding that Saxton Road will remain two-lanes and be urbanized (new curb and gutter) with extension of the existing sidewalk further south to Elwood Street where a pedestrian crossover will be installed. No changes to the lane configurations at the study area intersections are proposed, therefore

for the purpose of the operational analysis in this study, the future road network is considered to remain unchanged from the existing.

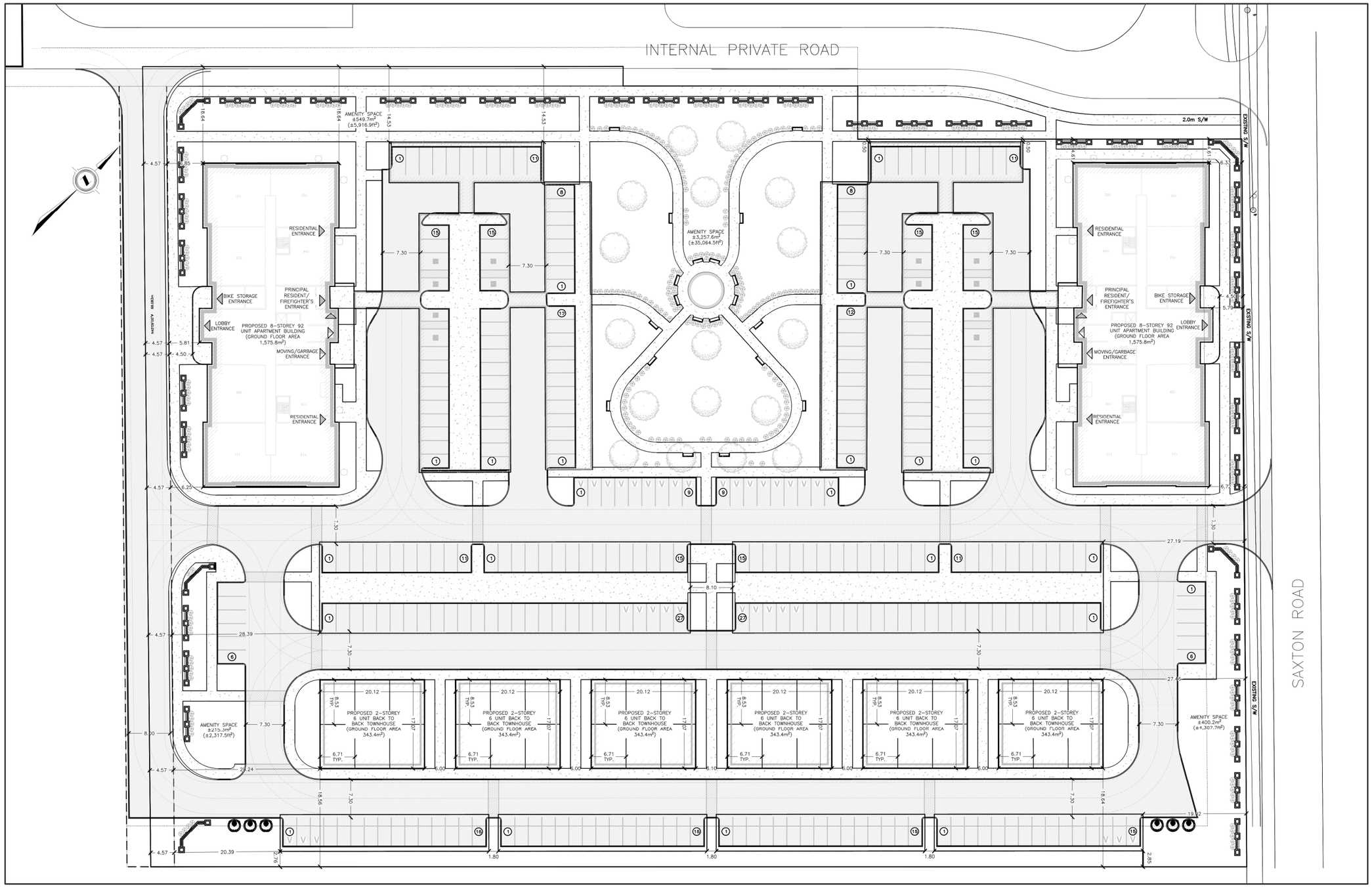
The 2022 *Strathroy-Caradoc Transportation Master Plan* (TMP) identifies the Carroll Street East and Saxton Road intersection for potential future intersection improvements. The TMP recommends signalization of the intersection in the medium term (6 – 15 years) suggesting that signalization would provide a controlled crossing for pedestrians and cyclists and also provide an indication to westbound travellers that they are entering the urban area. Review of traffic signal warrants and the potential need for intersection improvements are included later in this report.

4 PROPOSED DEVELOPMENT

4.1 DEVELOPMENT PLAN

The development is proposed to include two eight-storey apartment buildings with 92 residential units each, plus 36 back-to-back townhouse units (total of 220 dwelling units). A cropped version of the Site Plan is provided in Figure 12 and the full version of the drawing is included in Appendix D.

Figure 12: Site Plan



As shown on the Site Plan, vehicular accesses is proposed via a new driveway on Saxton Road and via a connection to the commercial property to the north. Surface parking will be provided for 318 vehicles on the property, which meets the Zoning Bylaw requirements.

4.2 SITE TRAFFIC GENERATION AND DISTRIBUTION

Site generated traffic volumes from the proposed development have been estimated based on trip rate information contained in the ITE *Trip Generation Manual 11th Edition*. The "Multifamily Housing (Mid-Rise)" (Land Use Code 221) land use was used for trip generation estimates for the apartment building units and the "Single Family Attached Housing" (Land Use Code 215) was used for the townhouse units.

The resulting trip generation estimates are summarized in Table 8. A minor trip reduction of 10% was applied to account for some of the internal interaction trips that are expected to occur between this development and the commercial uses to the north that will be able to use the internal road connections.

Table 8: Trip Generation Summary

ITE LAND USE DESCRIPTION	Units	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Multifamily Housing (Mid-Rise) LUC 221	184	16	53	69	44	28	72
Single Family Attached LUC 215	36	4	13	17	11	7	18
Internal Interaction Reductions	10%	-5	-5	-10	-5	-5	-10
Total New Trips		**15**	**61**	**76**	**50**	**30**	**80**

As shown in Table 8, the new trip generation (two-way) for the proposed development is forecast to be 76 and 80 trips in the AM and PM peak hours, respectively.

The forecast development traffic has been distributed over the road network based on a combination of the existing traffic patterns in the area and expected origin/destinations. Table 9 summarizes the trip distribution applied to the site traffic.

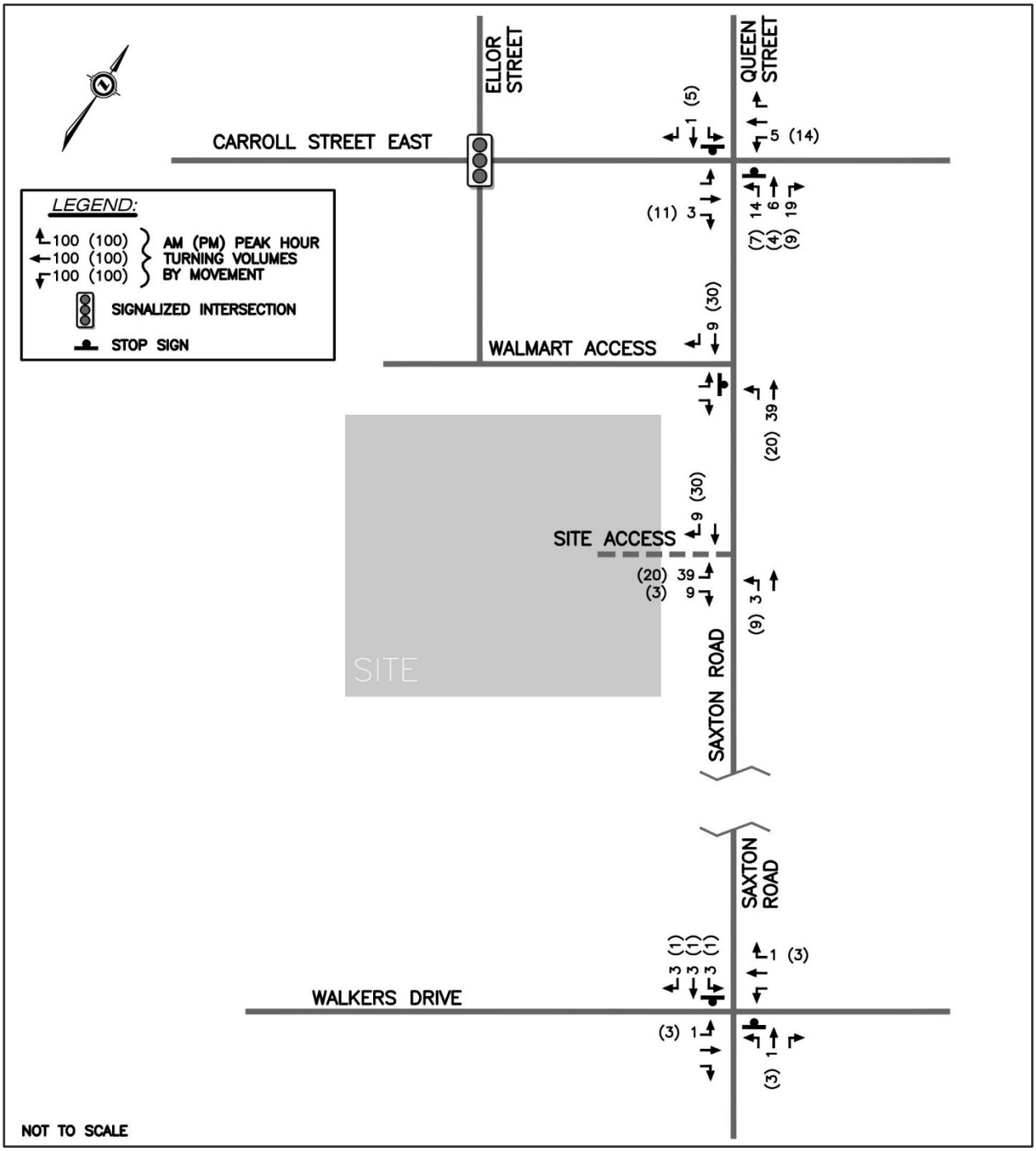
Table 9: New Trip Distribution Summary

DIRECTION TO / FROM	VIA	IN / OUT
North	Queen Street	10%
South	Saxton Road	5%
East	Carroll Street East Walkers Drive	30% 5%
West	Carroll Street East Walkers Drive	45% 5%
	Total	100%

It was assumed that all site traffic uses the proposed site access on Saxton Road except for 50% of the traffic to/from the west on Carroll Street East since those trips would have a more direct route entering/exiting through the internal road connections to the north.

The resulting site traffic from the proposed development is illustrated in Figure 13.

Figure 13: Site Traffic



4.3 ACCESS CONSIDERATIONS AND SITE PLAN REVIEW

4.3.1 SAXTON ROAD SITE ACCESS CONSIDERATIONS

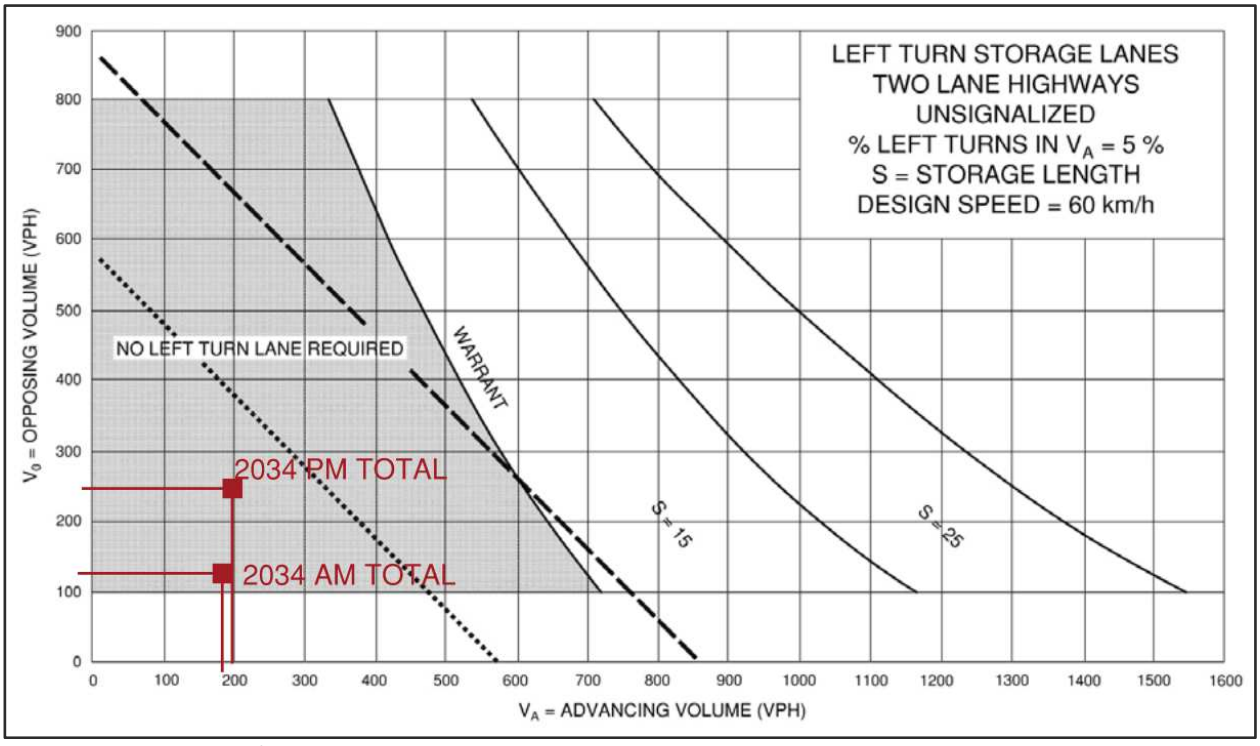
The site access is proposed as a full movement driveway with one inbound lane and one outbound lane.

The proposed site access is located on Saxton Road approximately 75 m south of the existing Walmart Access and 75 m north of the nearest driveway to the south (access to 24603 Saxton Road), measured centerline to centerline, therefore there are no concerns with access spacing.

Sightlines along Saxton Road at the proposed site access location were reviewed with respect to Transportation Association of Canada (TAC) guidelines for intersection sight distances. The proposed site access location is at a low point along the Saxton Road profile and the sight distance is limited to approximately 200 m to the north and south, however, this is more than sufficient to satisfy the TAC intersection sight distance requirement of 130 m for turning movements from a minor road (access) at a design speed of 60 km/h.

Left turn lane requirements for the proposed site access were reviewed based on the left turn lane warrant graphs from the *Ministry of Transportation Design Supplement for the TAC Geometric Design Guide for Canadian Roads, June 2017* (MTO Design Supplement). For an undivided two lane road, the warrant is based on the hourly percentage of left turning vehicles, the advancing traffic volume and the volume of opposing traffic. Using the combination of site traffic and 2034 background traffic (i.e. the 2034 total traffic, as presented in Section 5), the warrant graph is shown in Figure 14.

Figure 14: Left Turn Lane Warrant Analysis for the Proposed Site Access



Source: MTO Design Supplement

Based on the warrant graph in Figure 14, a left turn lane is not warranted on Saxton Road for the proposed site access.

4.3.2 INTERNAL ACCESS CONNECTIONS

A vehicular access will also connect the site to the commercial property to the north. This connection will have a stop-controlled intersection with only minor traffic volumes, therefore there are no concerns about its operations.

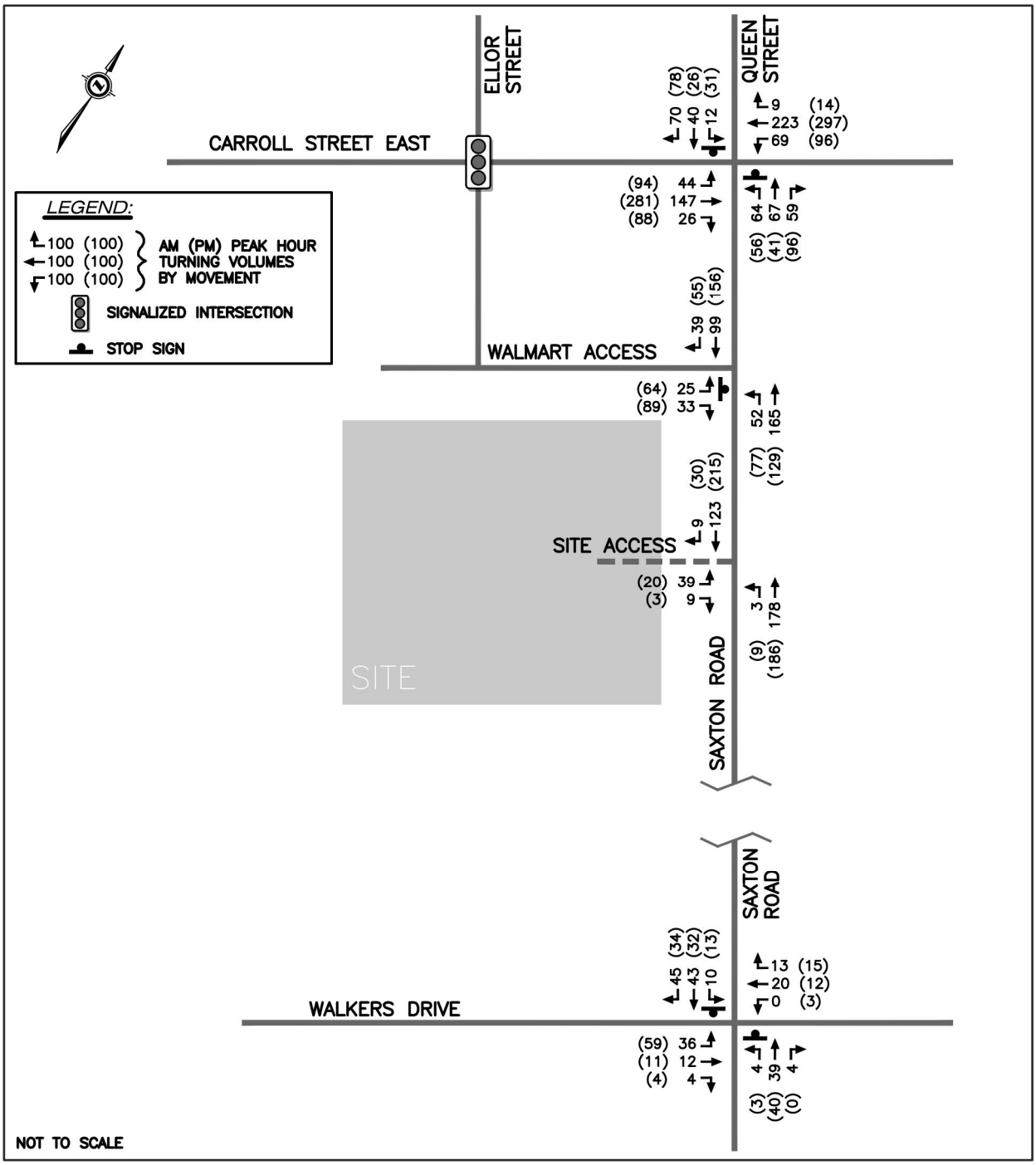
4.3.3 PEDESTRIAN CONNECTIONS

The proposed site plan will provide many pedestrian walkways through the site with connections to the municipal sidewalk on Saxton Road and to the commercial property to the north, which will provide appropriate pedestrian access for future residents.

5 FUTURE TOTAL TRAFFIC

The total future traffic is determined by combining the development traffic (site traffic) from Section 4.2 with the future background traffic from Section 3.3. The resulting 2034 total traffic volumes for the weekday AM and PM peak hours are shown in Figure 15.

Figure 15: 2034 Total Traffic Volumes



5.1 FUTURE TRAFFIC SIGNAL WARRANT ANALYSIS

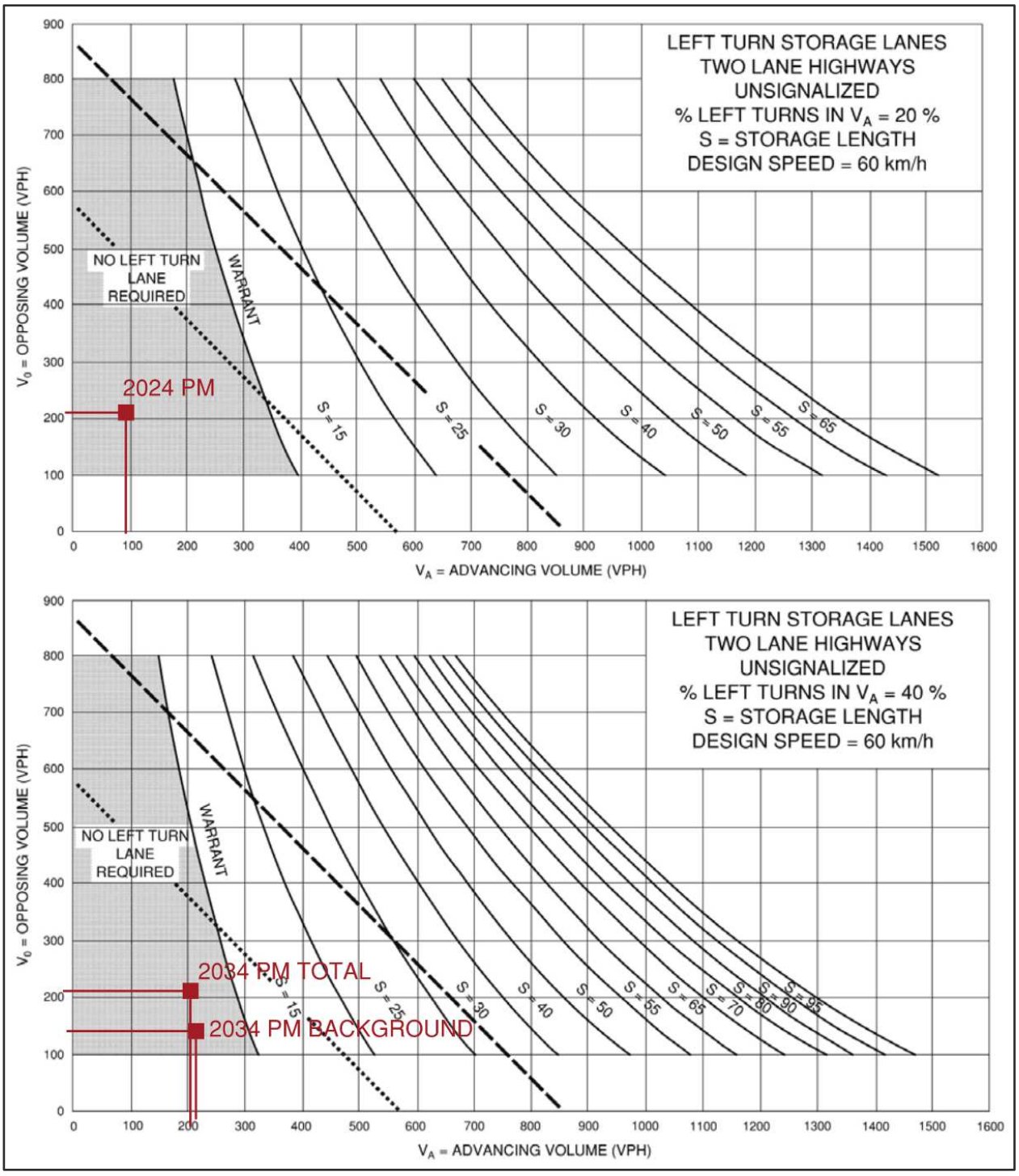
Traffic signal warrant analysis was undertaken for the Carroll Street East and Saxton Road intersection to determine if traffic signals may be warranted under future traffic conditions. The analysis was based on the *Ontario Traffic Manual Book 12* Justification 7 for Projected Volumes. Justification 7 uses the peak hour traffic volumes, and in the case of forecast volumes at an existing intersection, it requires that 120%

of the warrant threshold be met to satisfy the warrant. It was concluded that traffic signals are not anticipated to be warranted under the 2034 background or total traffic conditions (highest warrant value reached is only 70% fulfilled). The signal warrant analysis sheets are contained in Appendix E.

5.2 LEFT TURN LANE WARRANT ANALYSIS – EXISTING WALMART ACCESS

Left turn lane warrants for the northbound approach of Saxton Road at the Walmart Access were reviewed based on the left turn lane warrant graphs from the MTO Design Supplement. The warrant graphs are shown in Figure 16 for the PM peak hour (worst case) for existing traffic, 2034 background traffic, and 2034 total traffic.

Figure 16: Left Turn Lane Warrant Analysis for Saxton Road at the Walmart Access



Source: MTO Design Supplement

As shown in Figure 16, a left turn lane on Saxton Road at the existing Walmart Access is not warranted within the 2034 horizon period.

6 FUTURE TRAFFIC OPERATIONAL ANALYSIS

Intersection operations were re-assessed for future background and total traffic conditions. The results of the future conditions analysis are summarized in Table 10. Detailed Synchro reports for the future background traffic and future total traffic are available in Appendix F and Appendix G, respectively.

Table 10: 2034 Intersection Operations Summary

INTERSECTIONS / MOVEMENTS		2034 BACKGROUND				2034 TOTAL			
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR	
		V/C	LOS	V/C	LOS	V/C	LOS (DELAY)	V/C	LOS (DELAY)
Carroll Street East and Saxton Road	EB L	0.04	A	0.08	A	0.04	A	0.08	A
	EB TR	0.12	A	0.23	A	0.12	A	0.24	A
	WB L	0.06	A	0.08	A	0.06	A	0.09	A
	WB TR	0.16	A	0.20	A	0.16	A	0.20	A
	NB LTR	0.55	D	0.77	**F (57)**	0.69	E	**0.95**	**F (94)**
	SB LT	0.20	C	0.42	E	0.22	C	0.50	**F (61)**
	SB R	0.11	B	0.12	B	0.11	B	0.12	B
Saxton Road and Walmart Access	EB L	0.10	B	0.28	B	0.10	B	0.30	B
	NB LT	0.05	A	0.07	A	0.05	A	0.07	A
	SB TR	0.09	A	0.13	A	0.10	A	0.15	A
Saxton Road and Walkers Drive	EB LTR	0.03	A	0.04	A	0.03	A	0.04	A
	WB LTR	0.00	A	0.00	A	0.00	A	0.00	A
	NB LTR	0.09	B	0.07	B	0.10	B	0.08	B
	SB LTR	0.15	B	0.11	B	0.17	B	0.12	B
Saxton Road and Proposed Site Access	EB LR	N/A				0.09	B	0.05	B
	NB LT					0.00	A	0.01	A
	SB TR					0.10	A	0.17	A

Notes: V/C - Volume to Capacity Ratio, LOS – Level of Service, Delay – Average Delay in Seconds
EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound
L – Left, T – Through, R – Right

For the Carroll Street East and Saxton Road intersection, the results in Table 10 show that the northbound approach and the southbound left-through lane will operate at LOS F during the PM peak hour under the 2034 background and/or total traffic conditions (i.e. considerable delay to those movements). Although movements at LOS F are not uncommon at stop-controlled intersections along busy arterial roads and are generally considered tolerable for short periods, the northbound movement also reaches fairly high v/c ratio of 0.95, which indicates that additional capacity will be required around 2034 if all of the proposed developments in the area are fully built out in that timeframe. Potential intersection improvements are discussed in the next subsection (6.1).

The rest of the study area intersections will continue to function well through the horizon period, including the proposed site access, with all movements at LOS B or better and low v/c ratios.

Queuing results for the 2034 background and total traffic conditions were reviewed from the Synchro analysis to compare 95th percentile queue with the available storage lengths and the results are presented in Table 11.

Table 11: 2034 Intersection Queuing Summary

INTERSECTIONS / MOVEMENTS		AVAILABLE STORAGE (m)	95th PERCENTILE QUEUE (m)			
			2034 BACKGROUND		2034 TOTAL	
			AM	PM	AM	PM
Carroll Street East and Saxton Road	EB L	20	5	5	5	5
	WB L	20	5	5	5	5
	NB LTR	-	24	43	36	62
	SB LT	-	6	14	6	18
	SB R	25	5	5	5	5
Saxton Road and Walmart Access	EB LR	-	5	9	5	10
Saxton Road and Walkers Drive	NB LTR	-	5	5	5	5
	SB LTR	-	5	5	5	5
Saxton Road and Proposed Site Access	EB LR	-	N/A		5	5

Notes: EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound
L – Left, T – Through, R – Right
Queue lengths that were less than 5 m have been rounded up to 5 m to represent a minimum of one car length.

The results in Table 11 indicate that no queuing concerns are expected at the study area intersections.

6.1 CARROLL STREET EAST AND SAXTON ROAD POTENTIAL INTERSECTION IMPROVEMENTS

Since the earlier signal warrant analysis indicated that traffic signals will not be warranted by 2034 for the Carroll Street East and Saxton Road intersection, and the critical need is for more capacity for the northbound movement, the Municipality could consider the installation of a northbound right turn lane as an interim improvement until the eventual signalization that is recommended in the Municipality's TMP.

The Carroll Street East and Saxton Road intersection operations were re-assessed for both of these potential improvement scenarios (i.e. with the addition of a northbound right turn lane, and with signalization, which assumed left turn lanes on all approaches). The results are summarized in Table 12 and the Synchro output reports are provided in Appendix H.

Table 12: Intersection Improvements Operations Summary

INTERSECTIONS / MOVEMENTS		2034 BACKGROUND				2034 TOTAL			
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR	
		V/C	LOS	V/C	LOS	V/C	LOS (DELAY)	V/C	LOS (DELAY)
Carroll Street East and Saxton Road **WITH ADDED NORTHBOUND RIGHT TURN LANE**	EB L	0.04	A	0.08	A	0.04	A	0.08	A
	EB TR	0.12	A	0.23	A	0.12	A	0.24	A
	WB L	0.06	A	0.08	A	0.06	A	0.09	A
	WB TR	0.16	A	0.20	A	0.16	A	0.20	A
	NB LT	0.49	D	0.64	**F (65)**	0.61	E	0.80	**F (95)**
	NB R	0.05	A	0.14	B	0.08	A	0.15	B
	SB LT	0.20	C	0.42	E	0.22	C	0.50	**F (61)**
	SB R	0.11	B	0.12	B	0.11	B	0.12	B
	Overall	0.25	B	0.31	A	0.27	B	0.34	A
Carroll Street East and Saxton Road **WITH TRAFFIC SIGNALS AND LEFT TURN LANES**	EB L	0.08	A	0.15	A	0.08	A	0.16	A
	EB TR	0.17	A	0.32	A	0.17	A	0.35	A
	WB L	0.11	A	0.14	A	0.11	A	0.17	A
	WB TR	0.24	A	0.28	A	0.24	A	0.29	A
	NB L	0.32	C	0.28	C	0.39	C	0.29	B
	NB TR	0.29	C	0.22	C	0.32	C	0.23	B
	SB L	0.07	B	0.19	C	0.07	B	0.17	B
	SB TR	0.22	C	0.15	C	0.22	C	0.16	B

Notes: V/C - Volume to Capacity Ratio, LOS – Level of Service, Delay – Average Delay in Seconds
EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound
L – Left, T – Through, R – Right

The results in Table 12 show that the addition of a northbound right turn lane on Saxton Road at Carroll Street East would provide some additional capacity and keep v/c ratios at acceptable levels through the horizon period (maximum of 0.80 reached), however the operations of the northbound and southbound left-through lanes would still be at LOS F during the PM peak hour.

As a signalized intersection, Carroll Street East and Saxton Road would function well beyond the horizon period, with all movements at LOS C or better and all v/c ratios at or below 0.35.

It is recommended that the Municipality and County continue to monitor future traffic volumes and operations at the Carroll Street East and Saxton Road intersection to determine appropriate timing for signalization and/or the need for any interim capacity improvements.

7 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis completed, the following key conclusions and recommendations are made in this TIS:

- It is forecast that the proposed development will generate only 76 new trips in the AM peak hour (15 in and 61 out) and 80 trips during the PM peak hour (50 in and 30 out).

- Under existing conditions, all movements at the intersections within the study area are operating well. All movements have v/c ratios below 0.27 and operate at LOS C or better during the peak hours.
- The Municipality is currently upgrading Saxton Road to an urban cross-section with enhanced pedestrian facilities (construction is in progress) and the Municipality's TMP recommends that intersection improvements (signalization) be implemented for the Carroll Street East and Saxton Road intersection in the medium term (6 – 15 years).
- Traffic signal warrant analysis was performed for the Carroll Street East and Saxton Road intersection under both 2034 background and total traffic conditions and it was concluded that traffic signals are not expected to be warranted.
- MTO left turn lane warrants were reviewed for the potential need for a northbound left turn lane on Saxton Road at the Walmart Access under existing and future traffic conditions. It was determined that a left turn lane is not warranted.
- A left turn lane will not be warranted on Saxton Road at the proposed site access.
- We have no concerns about the proposed site access location on Saxton Road as it allows good visibility and does not conflict with any other accesses or intersections.
- Under 2034 background and total traffic conditions, the majority of the study area intersections will operate well with all movements at LOS B or better during the peak hours. The one exception is the intersection of Carroll Street East and Saxton Road, which will experience longer delays (LOS F) for the northbound and southbound movements during the PM peak hour, and the northbound movement will be nearing capacity (v/c ratio of 0.95) under 2034 total traffic conditions.

  Potential capacity improvements such as the addition of a northbound right turn lane or signalization were considered for the Carroll Street East and Saxton Road intersection. The addition of a northbound right turn lane would provide some additional capacity for the critical northbound movement (maximum future v/c ratio would be reduced to 0.80), but the northbound and southbound left-through lanes would still operate at LOS F during the peak hour.

  As a signalized intersection, Carroll Street East and Saxton Road would function well beyond the horizon period, with all movements at LOS C or better and all v/c ratios at or below 0.35.

  Since the need for additional capacity at the Carroll Street East and Saxton Road intersection will largely depend on the build-out of many developments in the area, we suggest that the Municipality and County continue to monitor the traffic volumes and operations at the intersection to determine appropriate timing for future signalization and/or the need for any interim capacity improvements.

8 LIMITATIONS

This Report was prepared by Strik, Baldinelli, Moniz Ltd. (the Consultant) for 2102603 Ontario Inc. (owner), the Municipality of Strathroy-Caradoc, and the County of Middlesex. Use of this Report by any third party, or any reliance upon its findings, is solely the responsibility of that party. Strik, Baldinelli, Moniz Ltd. accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions undertaken as a result of this Report. Third party use of this Report, without the express written

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All findings and conclusions presented in this Report are based on information as it appeared during the period of the investigation. This Report is not intended to be exhaustive in scope, or to imply a risk-free development. It should be recognized that the passage of time may alter the opinions, conclusions, and/or recommendations provided herein.

The analysis was limited to the documents referenced herein. Strik, Baldinelli, Moniz Ltd. accepts no responsibility for the accuracy of the information provided by others. All opinions, conclusions, and/or recommendations presented in this Report are based on the information available at the time of the review.

Appendix A – Traffic Data

Appendix B – Synchro Output Reports - Existing Traffic

Appendix C – Background Development Site/Draft Plans

Appendix D – Site Plan

Appendix E — Traffic Signal Warrant Sheets

Appendix F – Synchro Output Reports - 2034 Background Traffic

Appendix G - Synchro Output Reports - 2034 Total Traffic

Appendix H – Synchro Output Reports – Carroll Street East and Saxton Road Improvement Options